

What is claimed is:

1. A method of breeding an animal line for experimental use, comprising:
preselecting a first population comprising a plurality of conspecific animals of breeding age;
preselecting a range of breeding periods of varying lengths;
arbitrarily assigning to each animal of said first population a breeding period from the preselected range; and
allowing each animal to breed only during its assigned breeding period.
2. The method of Claim 2, wherein arbitrarily assigning is accomplished by random or pseudo-random means.
3. The method of Claim 2, wherein the preselected breeding period is bounded by a first chronological age and an older second chronological age of the animal.
4. The method of Claim 2, wherein the preselected breeding period is bounded by a first calendar date and a later second calendar date.
5. A method of breeding an animal line for experimental use, comprising:
preselecting a first population of one or more conspecific animal(s) comprising cells comprising chromosomes with telomeres of determinable lengths;
determining a statistical distribution of telomere lengths among cells of the animals of said first population;
permitting animal(s) with a desired distribution of telomere lengths to produce offspring.
6. The method of Claim 5, further comprising selecting the offspring to produce a second population, such that the statistical distribution of telomere lengths among the animals of said second population is modified compared to the distribution

among the animals of said first population, wherein said second population is intended for experimental use.

7. The method of Claim 5, further comprising the step of altering a telomere length of one or more chromosomes contained in a germ cell of an animal belonging to said first population.

8. A method of conducting an experiment, comprising:
selecting a population of conspecific animals, said animals comprising tissues comprising cells having chromosomes with telomeres of determinable lengths;
modifying the statistical distribution of telomere lengths among the animals, or among the tissues or cells thereof; and
performing an experiment, wherein at least one animal of the population, or at least one tissue or cell of the animal(s), is a subject of the experiment.

9. The method of Claim 8, wherein modifying the statistical distribution of telomere lengths further comprises altering a telomere length of one or more chromosomes contained in a cell of an animal belonging to said population.

10. The method of Claim 8, wherein modifying the statistical distribution of telomere lengths comprises the method of Claim 1.

11. The method of Claim 8, wherein modifying the statistical distribution of telomere lengths comprises the method of Claim 6.

12. A method of testing the safety of a chemical agent, comprising:
administering a chemical agent to be safety-tested to a first population comprising one or more conspecific animal(s), or comprising a tissue or cell of said animal(s), the tissue or cell comprising chromosomes with telomeres of determinable lengths, said first population having been preselected to contain a first predetermined statistical distribution of telomere lengths;

detecting the presence or absence of an adverse physiological and/or morphological response to the chemical agent, whereby the safety of the chemical agent is evidenced by the lack of an adverse physiological and/or morphological response.

- 5 13. The method of Claim 12, wherein the distribution is a normal distribution.
14. The method of Claim 12, wherein the distribution has one mode and is asymmetrically skewed.
- 10 15. The method of Claim 12, wherein the mean value of the distribution differs from a wild type reference value by at least twofold.
- 15 16. The method of Claim 12, further comprising administering the chemical agent to a second population of animal(s) conspecific with said first population, said second population having been preselected to contain a second predetermined statistical distribution of telomere lengths different from said first predetermined statistical distribution.
- 20 17. The method of Claim 12, wherein the biological or morphological response comprises neoplastic cellular proliferation.
18. The method of Claim 12, wherein the biological or morphological response comprises hyperplastic, cytologically dysplastic and/or premalignant cellular growth or proliferation.
- 25 19. The method of Claim 12, wherein the biological or morphological response comprises cytolysis.
20. The method of Claim 12, wherein the biological or morphological response comprises a metabolic toxicity.